

REMARKS

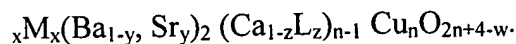
Claims 22-44 are pending. Claims 22-25, 27, 31, 32, 35, 37 and 39 have been amended. Claim 26 has been canceled.

The Examiner has requested that Applicant review the specification for any minor errors. In response thereto, Applicant has made typographical corrections as necessary. A substitute specification incorporating these changes is submitted herewith. Applicant declares that no new matter has been added. Figure 2 has been amended to include notations referenced at page 9, lines 27-31 of the specification.

Applicant's Response to the Rejection Under 35 U.S.C. §112

Currently, claims 22-44 stand rejected under 35 U.S.C. §112, first paragraph, because the specification, does not reasonably provide enablement for the broad "selective reduction type high temperature superconductor" as claimed.

Specifically, the Office Action notes that the specification only discusses in detail the embodiment of the superconductor compositions of the formula $\text{CuM}(\text{Ba}, \text{Sr})\text{CaLCuO}$ (*see* November 14, 2003 Office Action, page 2). In response thereto, Applicant has amended independent claims 22, 35 and 39 to include the limitation of claim 26. Namely, the limitation that the superconductor composition is of the formula Cu_1 .



Present claims 27-29, 37, 38 and 41-44 recite the limitation of a composition with the $\text{CuM}(\text{Ba}, \text{Sr})\text{CaLCuO}$ formula. Hence, as this formulation is specifically described in detail within the specification, Applicant respectfully submits that the claims are reasonably enabled by the specification (*see* pages 8-21 "Best Modes for Carrying Out

the Invention”), including embodiments wherein M is not present (*Id.* at page 9, line 19-32).

Applicant’s Response to the Rejections Under 35 U.S.C. §102 and §103

Claims 22-44 stand rejected under 35 U.S.C. §102(b), as anticipated by, or in the alternative, under 35 U.S.C. §103(a) as obvious over *Ihara et al.* Applicant respectfully traverses on the basis that the cited reference does not disclose, nor teach or suggest all the limitations of the current claims, specifically, the limitation that the charge supply layers have the selectively reducible atoms, so reduced, as set forth in independent claims 22, 35 and 39.

Ihara et al.’s earlier article does not disclose the claimed “reduction type” properties because the superconductor was not prepared by heat treatment in a reducing atmosphere. Wherefore, the polyvalent ions (*e.g.*, Tl ion) substituted for a portion of Cu ions in the charge supply layer have not been reduced (*see* specification, page 10, lines 10-18). Therefore, these ions would be a plus (+) trivalent state and the Tl 6s level will be above the Fermi level (*see* page 10, lines 25-27 and Figure 7).

However, in the present invention, when the superconductor is prepared utilizing oxygen reduction, the oxygen concentration is lowered and the Tl ions take a plus nonvalent state and thereby the Tl 6s level is below the Fermi level (*see* page 10, lines 27-29).

The result of selectively reducing the substituted Cu atoms in the charge supply layer is a difference in potential level between the different CuO₂ surfaces, and a difference in energy level. This permits the over-doped CuO₂ surface and the optimum-

doped to coexist in a unit cell and thus to have T_c , J_c and H_{irr} of the superconductor raised considerably (*see* specification, page 11, lines 25-30).

Therefore the disclosure which *Ihara et al.* made in the article in 1997 does not anticipate the present invention because it does not disclose a reduced Cu substituted atom in the charge supply layers, and therefore, would not exhibit the improved properties thereof.

Currently, claims 22-25, 30, 32-36, 39-40 stand rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over *Shimoya* (Strong Flux Pinning . . .) or *Shimoya* (Dramatically improved Flux Pinning Properties . . .). As above, Applicant respectfully submits that the cited references do not disclose an embodiment which utilizes selective reduction. The selective reducing process is necessary to mark T_c beyond 130K.

Applicant notes that the rejection extends only to the claims which did not encompass the $\text{CuM}(\text{Ba}, \text{Sr})\text{CaLCuO}$ formula limitation. *Shimoya's* articles do not disclose the formula which is now a limitation. Hence, as Applicant has amended the claims in response to the above §112 rejection, to include the formula, Applicant respectfully submits that the *Shimoya* references do not anticipate the amended claims.

Claims 22-44 stand rejected under 35 U.S.C. §102(e) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over *Usami et al.* (USP 5,776,862).

Applicant notes that the method of fabricating the semiconductor by use of an oxidizing gas is repeated throughout the reference (*see* Abstract; column 2, lines 10-17; claims 4-13). As such *Usami et al.* mirrors art disclosed in the specification. Specifically, page 1, lines 25-30, which states “. . . doping with positive holes to obtain a higher carrier

concentration has been thought to require a higher oxygen partial pressure, and it has so far been unattainable to prepare . . . in a reduction process conditioned under low partial pressure or vacuum.”

Hence, *Usami et al.* clearly teaches away from the current invention and instead is art which does not realize raising the carrier concentration in a reduction process as taught by the present invention. Applicant refers to the remarks above, that the selective reducing process is a limitation of the present invention not disclosed in the current reference.

Hence, Applicant respectfully submits that the current invention as claimed is not disclosed nor taught or suggested by *Usami et al.*, because the reference does not include the selective reducing process.

Claims 22-44 stand rejected under 35 U.S.C. §102(e) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over *Ihara et al.* (USP 6,281,171), *Ihara* (USP 6,444,620), or *Ihara et al.* (USP 5,919,735).

Ihara is the sole inventor of USP 6,444,620. 35 U.S.C. §102(e) requires that the reference be “by another.” Wherefore, this reference does not appear to be prior art within the definition of the statute and Applicant respectfully requests the rejection as to this reference be withdrawn.


As to *Ihara* ‘171 and ‘735 co-invented by the present applicant, Applicant reasserts the argument as above. Namely, neither of the references disclose nor teach or suggest the selective reduction and the $T_c \geq 130K$ which can be achieved thereby. Hence, the reference fails to teach a limitation of the presently claimed invention.

For at least the foregoing reasons, it is believed that this application is now in condition for allowance. If, for any reason, it is believed that this application is not in condition for allowance, Examiner is encouraged to contact the Applicants' undersigned attorney at the telephone number below to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 50-2866.

Respectfully submitted,

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Attachment: Substitute Specification (marked-up and clean)
Replacement Sheet – Figs 2A-2C
Change of Correspondence Address
MJC/SMD/rer